The Need for Gifted Programming in Creativity

An Honors Thesis (HONR 499)

by

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Abstract

Creativity has traditionally been noted as an important component of gifted education. Researchers such as Renzulli (2011) and Sternberg (2003) have noted creativity as an integral facet of what it means to be gifted, and the national definition of giftedness, as well as many state definitions, list creativity as a domain in which students can be gifted. However, despite its presence in many definitions, many gifted programs lack programming in creativity. Due to the lack of guidelines for programming in creativity, challenges with identification, and an overall struggle to recognize how creativity can go hand-in-hand with academic content, many schools have ignored its presence in their definition. This thesis explores why creativity is a necessary and important component of gifted education, as well as what options exist for identification and programming. At this time, it is evident that the Torrance Test of Creative thinking (TTCT), Scales for Identifying Gifted Students (SIGS), and portfolios are promising assessment methods for identification, and the Thinking Actively in Social Context (TASC) Model and Incubation Model are programming options that would allow for programming in creativity while still following an academic-based curriculum. However, further research should be done to improve identification and programming in creativity.

Acknowledgments

I would like to thank Dr. Rebecca Brown for advising me through this project. Not only did she believe in me when I did not believe in myself, but she worked with me every step of the way. Without her guidance and impeccable planning, I would not have completed my honors thesis.

I would like to thank Dr. Lisa Rubenstein for everything she has taught me. Her inspiring courses are what fueled my passion for gifted education, which ultimately led me to writing this thesis.

I would also like to thank Andy Slosar for encouraging me to pursue this daunting task and giving me a productive work environment amidst a global pandemic to ensure that I could complete this thesis in time.

Process Analysis Statement

I have always been interested in gifted education. The Gifted and Talented Education concentration program that Ball State offers is what drew me to Ball State in the first place, and is ultimately the reason why I chose to attend Ball State for my undergraduate degree. Through my Gifted and Talented Education courses, I quickly learned that gifted education involves much more than simply academic ability. Specifically, the course EDPS 411, Development of Creative Thinking, showed me how creativity plays an important role in gifted education. As I studied the characteristics of creative people in this course, I felt a deep connection with what researchers were saying. As I continued in my education courses and learned more about gifted programming and policies, I noticed that most often, schools only offered programming in math, language arts, or both. Despite this, however, most definitions of giftedness included creativity as a critical component. Being a creative person, myself, this made me

Although I did not begin my thesis until I had completed all of my Gifted and Talented Education courses, the knowledge and experiences I gained from these courses played a huge role in writing this thesis. Through a semester-long immersive program called Math in Cultural Contexts (MICC), where I taught in a 2nd/3rd grade gifted classroom at East Washington Academy, as well as my student teaching experience in a 4th grade gifted classroom at East Washington Academy, I gained invaluable insight into what gifted programming looks like within the school setting. Throughout various courses with Dr. Rubenstein, I was also able to tour Sycamore school for the gifted and spend a day in a 5th/6th gifted classroom at Wilbur Wright Elementary. These experiences broadened my view of gifted programming in Indiana, allowing me to see how programming differs among schools.

When it finally came time to begin my thesis, the knowledge I gained from my concentration courses provided a nice background for research. I was able to look back on many articles and notes from my courses to find resources for my thesis. In addition to this, I used online databases and books from various professors to conduct further research. The writing process was not easy for me, but with the guidance of Dr. Brown, I was able to form a coherent narrative for my thesis. Although I initially began writing my thesis the semester before I student taught, student teaching became a big blockade in my writing process. I had not anticipated how time-consuming it would be, and with it came a period of several months with no writing. However, as I revisited my thesis towards the end of the spring semester, a new surge of motivation hit.

As far as the research process for this thesis goes, I did not have many obstacles. As I have already said, my concentration courses laid the groundwork for my research. I went into this thesis with considerable passion for gifted education and creativity, and because of my deep background knowledge it was not challenging to find the information necessary to back up my thesis. I began the research process by looking back on resources from my courses and reading through gifted education programming books from Dr. Brown. I found a lot of information from the National Association for Gifted Children, and I also used databases to look up various journals and articles written by well-known researchers in the field such as Renzulli, Rubenstein, Sternberg, and Guilford. Of all the research I conducted, it was most challenging to find information on the standardized tests used to identify gifted students, such as the NWEA. CogAT, and ILEARN. In order to keep the tests valid, there is not much information readily available on many standardized tests, and in addition to this, ILEARN is a fairly new assessment, so not many studies have been conducted on it yet. However, after visiting the websites of the

companies who designed these assessments, as well as the Indiana Department of Education site, I was able to gain enough background information to describe these tests.

Although this thesis challenged me, I was determined to write it because of my passion for gifted education and creativity. I am aware that many people who read this thesis may not be familiar with gifted education, and I have gone into detail on many things as such. However, my hope is that whoever reads this thesis will come in with an open mind and that they will take to heart all that I have to say. I truly love gifted education and hope that someday I can make a difference in the lives of gifted children. Perhaps this thesis can even be a stepping stone that leads to changes in gifted programming regarding creativity.

Introduction

Although the field of gifted education may not be well-known to many, the works of gifted individuals have been noticed by all. When looking at the accomplishments of people like Albert Einstein, Pablo Picasso, and Wolfgang Mozart, it is easy to say they were gifted. However, when it comes to education in the twenty-first century, most people tend to think of "giftedness" only in terms of people who perform above-average academically when compared to their peers. While it is true that academic achievement is a large factor of giftedness, defining it as such is limiting, and researchers in education and psychology say that giftedness is much more. In an effort to better define giftedness for what it is, Sternberg (2003), created the WICS model of giftedness, which stood for wisdom, intelligence and creativity. Sternberg believed that, "without a synthesis of these three attributes, someone can be a decent contributor to society, and perhaps even a good one, but never a great one" (p. 112). Similarly, Renzulli's (2011) three ring conception of giftedness explains that, "giftedness consists of an interaction among three clusters of traits — above-average but not necessarily superior general abilities, task commitment, and creativity" (p. 87). Thus, researchers have come to realize that creativity is a common characteristic of many gifted students and that students can be gifted across a wide variety of domains.

According to the National Association for Gifted Children (NAGC), the current federal definition of giftedness, originally developed in the 1972 Marland Report to Congress, states that gifted students are

> students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic

> fields, and who need services and activities not ordinarily provided by the school in order to fully develop those capabilities. (para. 1)

From this definition, it is clear that the national definition matches what researchers are saying, and there is a consensus that children could be gifted in either intellectual or creative domains. In theory, having this flexible definition of giftedness should allow schools to provide for a wider range of students by meeting a variety of additional needs through different services; however, this is not the case. Despite the inclusive definition, the programming offered in the vast majority of schools throughout the country and in Indiana does not provide services to enrich students who are creatively gifted.

Gifted Programming

In order to understand the issues with gifted programming in Indiana regarding programming in creativity, it is important to understand how gifted programs came to be and the principles with which they were developed. Although studies of giftedness date back to the 1920s with researchers Lewis Terman (1926) and Leta Hollingworth (1929), gifted education did not develop until the late 1950s. After the Soviet Union launched Sputnik into space, the government began to invest in research to identify students who would benefit the most from advanced courses in mathematics, science, and technology programming. In 1958, the National Defense Education Act (NDEA) passed through Congress, marking the first large-scale effort to establish gifted programming. The NDEA provided funding to improve schools and encouraged people to pursue postsecondary education. However, the main agenda of the NDEA was to increase the United States' ability to compete with the Soviet Union in science and technology, so the efforts to improve education were mostly focused in math and science.

In 1972, the Marland Report became the first national report on gifted education, proposing a definition of giftedness that would later evolve into the national and state definitions known today. According to Marland (1972),

> gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society. (p. 8)

Unlike the NDEA, which only proposed advanced courses in math and science, the Marland Report argued that differentiated programs were necessary in order for gifted children to reach their potential. In addition to this, Marland also broadened the notion of what a gifted child is, explaining that gifted children, "include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination: general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts, [and] psychomotor ability" (p. 8). Twenty years after the Marland Report, the NAGC published the first standards for gifted education programs, which helped guide gifted programs across the nation (2008). Today, gifted programs vary widely across the country. Although the NAGC standards and the definition established in the Marland Report provided states with guidelines for identification and programming, there are no specific national mandates on gifted education, leaving the responsibility up to each state.

With gifted programming decided at a state level and dependent on local leadership, many discrepancies exist within the field; however, schools typically have specific identification processes for admitting students, as well as a program curriculum, structure, and mission. While

identification processes will be discussed more in depth later in regards to its application, it is worth noting that most schools include quantitative data from tests that measure both achievement and ability, as well as qualitative data. A variety of programming options exist, but self-contained classrooms are one of the most popular options. In this program, schools create classes of all gifted students. Pull-out programs are a more cost-effective program option, in which gifted students are taken out of their regular classroom for enrichment on a regular schedule. Cluster grouping is another common option in which a selected number of gifted students are grouped together in a regular classroom. When it comes to curricula used in gifted programs, Indiana also allows schools to make their own decisions. Indiana Code states that, "a plan must establish objectives for the school to achieve… [and these] objectives must be consistent with academic standards" (IC 20-31-5 Sec. 4-b), in an effort to ensure that all students are learning the same content. However, many schools choose to teach gifted students above-grade-level standards in order to ensure that the content is more rigorous. While the Indiana Department of Education (IDOE) has developed a High Ability Language Arts curriculum, schools are not required to use it. Although curricula vary by school, most schools in Indiana focus on providing enrichment through accelerated and differentiated content and hands-on inquiry-based learning. The Muncie Community Schools (MCS) multifaceted plan states that gifted students will

> understand, develop, and apply the skills of critical, logical, analytical, and creative thinking through the study of broad-based, multi-disciplinary problems, issued, and

> themes[1]… [and] pursue accelerated, differentiated curriculum which will allow him/her to become producers of original, sophisticated, and innovative products. (para. 1)

Similarly, the The Burris Laboratory School High Ability Plan (2016) states that services for elementary students include, "differentiated units, tiered assignments, curriculum compacting, forming contracts, independent study, advance content, computer-based instruction, and telescoped content" (para. 5). While these multifaceted plans are somewhat vague, it is evident that no two programs are exactly alike, yet the goals are generally the same, with intentions to challenge students.

The Importance of Programming

Despite decades of research conducted on gifted education, many educators and school districts still do not understand the importance of gifted education. With the achievement gap at an all-time high, many schools believe it is more important to focus on allocating funding and resources for special education and English Language Learners (ELLs) in order to help bring up testing scores of those who are underachieving. While it is true that many of the nation's students are struggling to perform at basic levels on standardized testing, this does not mean that gifted individuals can be ignored. What schools are failing to understand is that in many instances, students who show high academic achievement or potential at a young age end up falling behind over time. According to Finn, Jr. and Northern from the Thomas B. Fordham Institute (2008), the United States is failing to cultivate the talents of young people, especially gifted individuals from disadvantaged and minority backgrounds. This is due to the lack of high quality gifted programs available throughout the nation. Without programming, gifted students are not challenged and

[1] The themes explored by each grade level are outlined further in-depth in the MCS Multifaceted Plan.

their skills are not cultivated, resulting in lost academic potential. Underachievement in gifted students has been discussed throughout the years by researchers such as Emerick (1992) and Peterson (2000, 2001, 2002). Rubenstein and her colleagues (2012) argued that, "even if students believe they have the skills (self-efficacy) to do well, if they do not see their schoolwork as meaningful, they may not complete it" (p. 680). Thus, if students are not challenged they may put in less effort, and over time they may even "lose" their giftedness. Rubenstein and her fellow researchers also explain that many schools undermine academic passion and contribute to a lack of intellectual stimulation by denying students of the opportunity to seek new knowledge through high quality gifted programming.

Although the United States was once known for its prestigious academic achievements, recent studies show that the United States is beginning to fall behind. In a 2015 PEW research study (see Figure 1), scientists discovered that when comparing the scores of 15-year-olds taking the Program for International Student Assessment (PISA), which measures students' abilities in science, math, and reading, to different countries, "the U.S. [placed] an unimpressive 38th out of 71 countries in math and 24th in science" (para. 2).

Figure 1

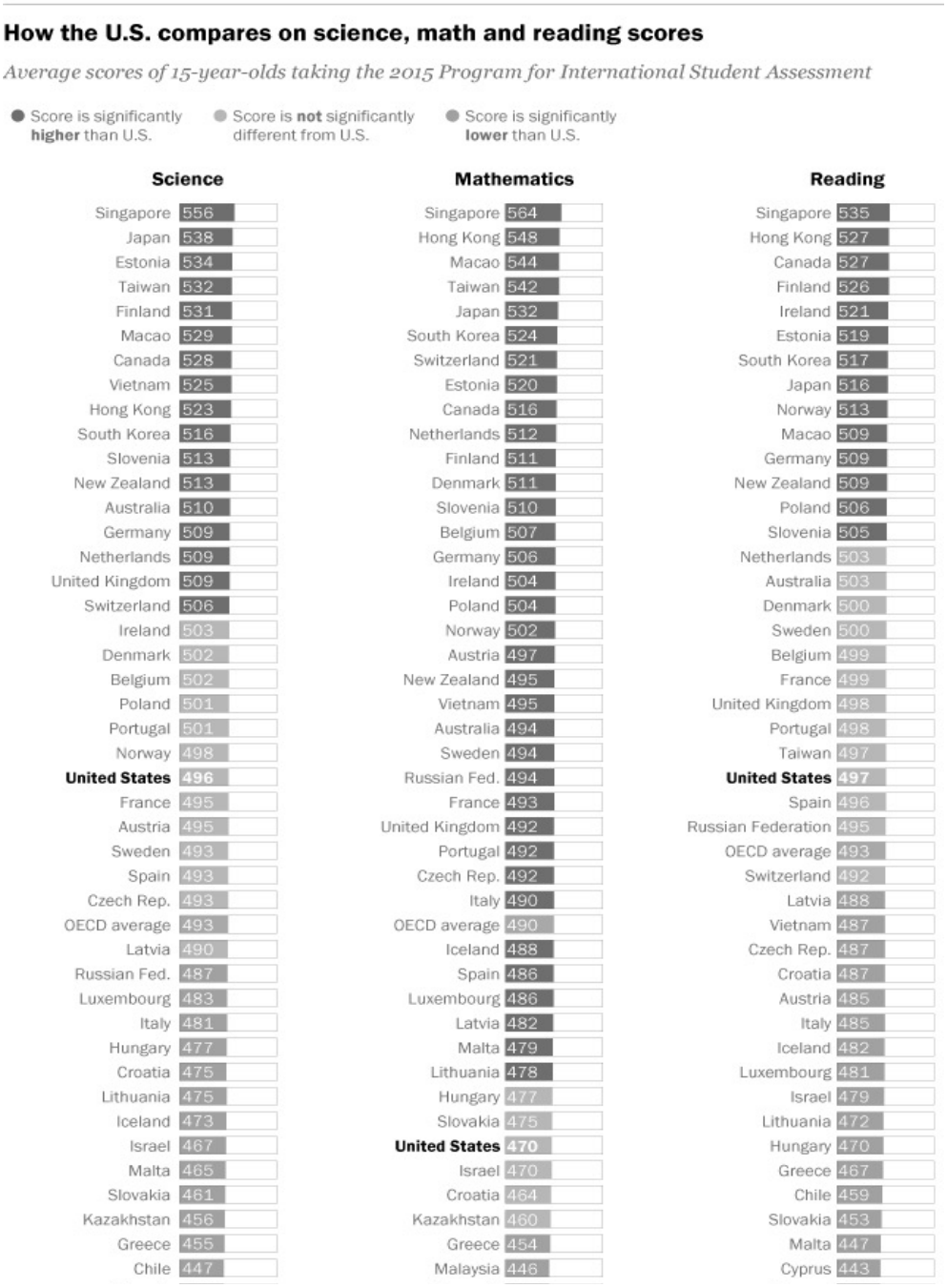
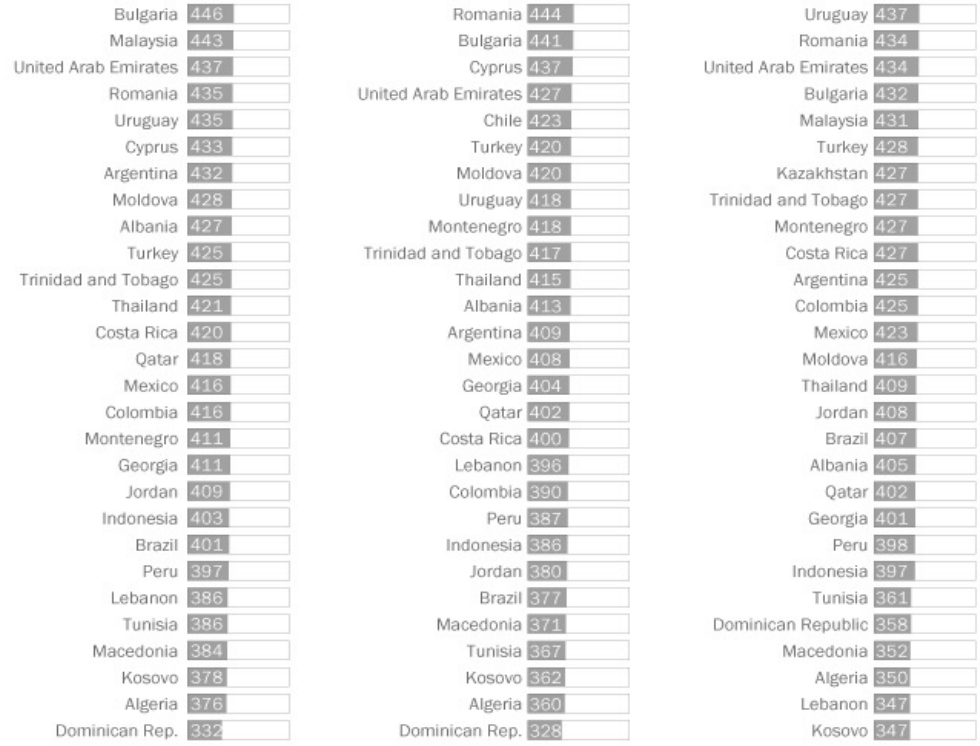

How the U.S. compares on science, math and reading scores
Average scores of 15-year-olds taking the 2015 Program for International Student Assessment
Score is significantly higher than U.S.
Score is not significantly different from U.S.
Score is significantly lower than U.S.
Science
Singapore 556
Japan 538
Estonia 534
Taiwan 532
Finland 531
Macao 529
Canada 528
Vietnam 525
Hong Kong 523
South Korea 516
Slovenia 513
New Zealand 513
Australia 510
Germany 509
Netherlands 509
United Kingdom 509
Switzerland 506
Ireland 503
Denmark 502
Belgium 502
Poland 501
Portugal 501
Norway 498
United States 496
France 495
Austria 495
Sweden 493
Spain 493
Czech Rep. 493
OECD average 493
Latvia 490
Russian Fed. 487
Luxembourg 483
Italy 481
Hungary 477
Croatia 475
Lithuania 475
Iceland 473
Israel 467
Malta 465
Slovakia 461
Kazakhstan 456
Greece 455
Chile 447
Mathematics
Singapore 564
Hong Kong 548
Macao 544
Taiwan 542
Japan 532
South Korea 524
Switzerland 521
Estonia 520
Canada 516
Netherlands 512
Finland 511
Denmark 511
Slovenia 510
Belgium 507
Germany 506
Ireland 504
Poland 504
Norway 502
Austria 497
New Zealand 495
Vietnam 495
Australia 494
Sweden 494
Russian Fed. 494
France 493
United Kingdom 492
Portugal 492
Czech Rep. 492
Italy 490
OECD average 490
Iceland 488
Spain 486
Luxembourg 486
Latvia 482
Malta 479
Lithuania 478
Hungary 477
Slovakia 475
United States 470
Israel 470
Croatia 464
Kazakhstan 460
Greece 454
Malaysia 446
Reading
Singapore 535
Hong Kong 527
Canada 527
Finland 526
Ireland 521
Estonia 519
South Korea 517
Japan 516
Norway 513
Macao 509
Germany 509
New Zealand 509
Poland 506
Slovenia 505
Netherlands 503
Australia 503
Denmark 500
Sweden 500
Belgium 499
France 499
United Kingdom 498
Portugal 498
Taiwan 497
United States 497
Spain 496
Russian Federation 495
OECD average 493
Switzerland 492
Latvia 488
Vietnam 487
Czech Rep. 487
Croatia 487
Austria 485
Italy 485
Iceland 482
Luxembourg 481
Israel 479
Lithuania 472
Hungary 470
Greece 467
Chile 459
Slovakia 453
Malta 447
Cyprus 443

Figure 1 (continued).



Note. Scale ranges from 0-1,000. Results from China not included because only four provinces participated in PISA 2015. From DeSilver, D. (2017, February 15). U.S. academic achievement lags that of many other countries. https://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/

Despite several national efforts to improve education, such as No Child Left Behind (NCLB) (2002) and the Every Student Succeeds Act (ESSA) (2015), America has done little to improve gifted education. This is surprising, considering that America is a nation that has always strived for excellence. As Davidson and his colleagues (2005) boldly stated in their book *Genius Denied*, "a nation that truly values achievement would not spend billions on special education while allowing states to spend nothing on the gifted" (p. 49). Thus, it is increasingly evident that in order to improve education in America, schools, especially in high-poverty areas, must invest in gifted programming.

The Creatively Gifted

While gifted programs exist sporadically across America, programs designed with domains other than Mathematics and English/Language Arts are even more uncommon. Typically, gifted programs in America seek to enrich students who show either high achievement or academic potential in Math or English/Language Arts, or both. However, the Marland Report (1972) concluded that giftedness is much more than this. Similarly, the IDOE states:

> 'High ability student' means a student who: (1) performs at or shows the potential for performing at an outstanding level of accomplishment in at least one (1) domain when compared with other students of the same age, experience, or environment; and (2) is characterized by exceptional gifts, talents, motivation, or interests" (IC 20-36-1). Furthermore, in section 2, the department of education specifies that, "'Domain' includes the following areas of aptitude and talent: (1) General intellectual. (2) General creative. (3) Specific academic. (4) Technical and practical arts. (5) Visual and performing arts. (6) Interpersonal. (IC 20-36-1)

Through this definition, it becomes clear that a high ability student may be a student who performs or shows potential to perform in creativity. This is possible because, by definition, students are only required to show accomplishment or ability in one domain in order to be considered a "high ability student." While *creativity* is not clearly defined in this definition, the creative personality was emphasized by Guilford (1950), which eventually lead to further research in this area. Much of the research conducted focused on identifying characteristics of creative individuals, which have remained consistent among researchers (Gough, 1979; MacKinnon, 1963; Sternberg, 1985; Torrance, 1963). According to Dawson and his colleagues (1999), "highly creative individuals have been described as 'impulsive', 'individualistic',

'nonconformist', and 'progressive'" (p. 57). While creativity may be more evident in children, Sternberg (2003) suggested that, "it is harder to identify in older children and adults because their creative potential has been suppressed by a society that encourages intellectual conformity" (p. 117). Thus, it is important to foster creative abilities while children are young. While many children may be innately creative, creative abilities can be developed through enrichment. Sternberg (2003) noted that, "creative work requires applying and balancing the three intellectual abilities—creative, analytic, and practical—all of which can be developed researchers as a domain in which people may be gifted" (p. 117). As such, in order to accommodate the needs of those who are creatively gifted, it is necessary to design specific programming to challenge and enrich students' creative abilities.

All too often, people argue that the focus of education should be on acquiring specific academic content knowledge. The entire educational system of establishing "common core" and the academic standards conveys the message that acquiring knowledge in specific subjects is the goal of education. However, in a democratic society, the purpose of education should be to not only help students acquire specific knowledge or skills, but to develop the knowledge, reasoning, creativity, skills, and dispositions necessary to continue their education throughout life. Dewey (1859) believed in progressive education, saying that, "schools and classrooms should be representative of real life situations, allowing children to participate in learning activities interchangeably and flexibly in a variety of social settings" (as cited in Williams, 2017, p. 92). In recent years, skills such as critical thinking and creativity have become the defining qualities that help students succeed in college and careers. This is due in part to the advancement of technology. With the amount of information available online, remembering academic content has become less important, while critical thinking has become more important. Borland (1997) notes

that, following the Marland Report, "the focus [of gifted education] switched from academic content to thinking skills of various sorts" (p. 12).

Programming for the Creatively Gifted

In viewing the vast majority of gifted programs in Indiana, programming is designed only for students who are gifted in math, language arts, or general intellectual. The IDOE's service options for students with high ability explicitly states that each year during the decision process, schools should, "identify the number of students for both High Ability Math and High Ability Language Arts (General Intellectual), HA math only, and HA Language Arts only" (p. 1). There is no mention of other domains, no clear process for identifying creatively gifted individuals, and no suggestions for specific enrichment, curriculum, or programming. Renzulli (2012) argued against this approach:

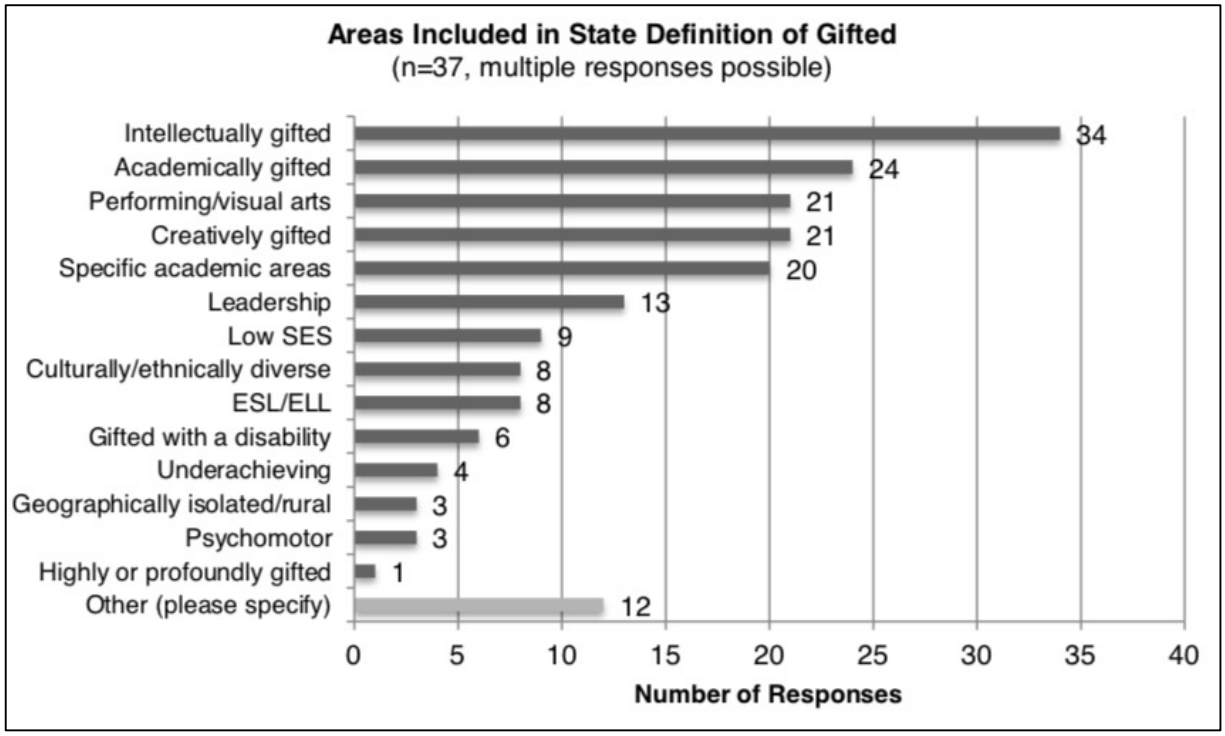
> if we agree that the goals of gifted education and talent development are to maximize young people's opportunities for self-fulfillment and increase society's reservoir of creative problem solvers and producers of knowledge, then it would seem wise that programming and services enhance students' capacity for creative productivity, not just content acquisition. (p. 150)

Furthermore, if Indiana is going to identify "general creativity" as a domain in which students can be gifted, it seems reasonable that there should be established programming options for the creatively gifted, as well as a clear process for identifying such individuals.

While it may seem unusual that Indiana has included creativity in their definition without further guidelines, this is actually common across America. In the 2014-2015 State of the States in Gifted Education Policy and Practice Data report, it was reported that 37 of the 39 states who responded had a state definition of giftedness. As illustrated in Figure 2, in these 37 states, only

21 (about 56%) included students who are creatively gifted in their definition, while 34 (about 92%) of states included students who are intellectually gifted.

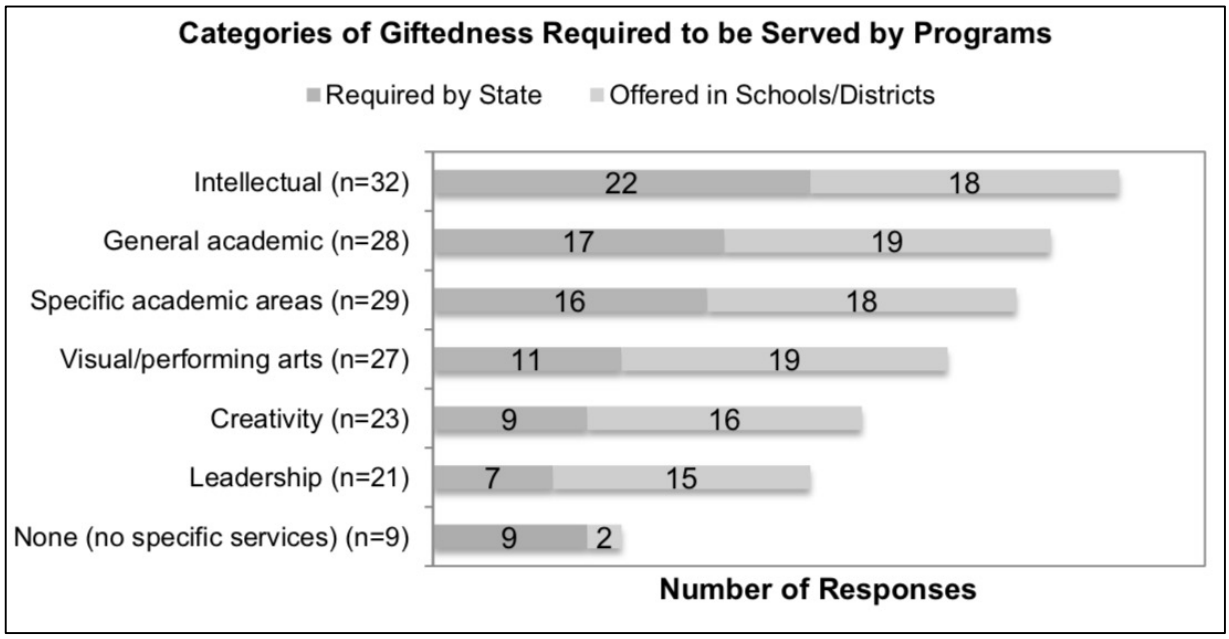
Figure 2



Note. From NAGC, & The Council of State Directors of Programs for the Gifted. (2015, November). 2014-2015 State of the States in Gifted Education [PDF]. Washington: National Association for Gifted Children.

Although the state of Indiana has included creativity as a possible domain in its definition of giftedness, the numbers shown in Figure 3 help provide a more accurate idea of the misrepresentation across the board. Furthermore, when looking at the number of states who actually require or offer programming in creativity, the numbers lower. Of the 32 states who reported about programs or services required, 23 states either required programming in creativity or offered it. However, only nine states said they required programming, meaning that only about 28% of states actually required programming in creativity as of 2015.

Figure 3



Note. From NAGC, & The Council of State Directors of Programs for the Gifted. (2015, November). 2014-2015 State of the States in Gifted Education [PDF]. Washington: National Association for Gifted Children.

Other states, like Indiana, said that they offered programming, but because there are no specific mandates by state, there is variance in what is offered among schools. Thus, it becomes clear that Indiana is not the only state that lacks gifted programming in creativity. To understand why this deficiency of programming exists, it may help to investigate potential barriers.

The Identification Process and Multifaceted Plans

The first barrier to offering programming in creativity lies not with the program design itself, but with the identification process and assessments necessary to support a program in creativity. The process of selecting students and determining whether or not they are eligible for gifted programs is a complex process. Identification policies and plans have been put in place in order to find an equitable pathway to admit students into programs and participate in experiences

that are designed to maximize the development of their gifts and talents. According to the NAGC,

> typically, identification policies and procedures are determined at the district level. Because no two gifted children are alike, it is important to collect information on both the child's performance and potential through a combination of objective (quantifiably measured) and subjective (personally observed) identification instruments in order to identify gifted and talented students. (n.d., para. 6)

This means that schools must create multifaceted plans for assessment in order to identify students for programming equitably.

In Indiana, schools have been required to identify students with high abilities in the general intellectual and specific academic domains since July 1, 2007 (IC- 20-36-2-2). Although specific identification processes remain a local decision in Indiana and vary by district, the IDOE High Ability Coordinator Handbook (Schuler et al., 2019) has outlined a list of accepted tests for one-step and two-step identification in measures of ability (verbal/quantitative reasoning), achievement (math/language arts), and aptitude for creativity. The handbook has also listed accepted standardized rating scales for math and language arts, as well as leadership, creativity, and motivation. The accepted standardized tests for one-step identification in measures of ability include: the Cognitive Abilities Test (CogAT), the Stanford-Binet Intelligence Test, the Wechsler Intelligence Scale for Children, the InView, the 8th edition of the Otis-Lennon School Ability, the Kaufman Assessment Battery for Children, and the Woodcock-Johnson III NU Test of Cognitive Abilities. When only testing for math, the Test of Mathematical Abilities for Gifted Students, the Orleans-Hanna Algebra Prognosis Test are also accepted.

According to the Muncie Community School (MCS) district's Multifaceted Student Assessment Plan (2017), they use the CogAT and the InView to identify student ability. The CogAT is a commonly-used test for students from kindergarten through high school that measures reasoning abilities. The test does not measure IQ, as achievement tests do, but rather determines the gained reasoning skills through educational experience. In their research on nonverbal testing, Lohman and his colleagues (2008) explained that the test consists of three different sections that measure verbal, quantitative, and nonverbal reasoning, and the content of these sections vary depending on their edition. With the primary edition, which is intended for grades K-2, children are not required to read but rather listen to the teacher read questions and select pictures that best answer each question. The verbal battery consists of questions about oral vocabulary and verbal reasoning; the quantitative battery tests relational and quantitative concepts; and the nonverbal battery includes matrices and figure classification. With the multilevel edition for grades 3-12, students read words to complete word analogies and classifications for the verbal battery, answer questions about quantitative relations and equation building for the quantitative battery, and complete figure classification, analogies, and analysis for the nonverbal battery. The InView is an assessment from CTB McGraw Hill (2010), which is a branch of the Data Recognition Corporation, that assesses students' cognitive abilities through a sequence of five different tests. These tests include: Verbal Reasoning: Words, Verbal Reasoning: Context, Sequences, Analogies, and Quantitative Reasoning. The High Ability Coordinator Handbook's (Schuler et al., 2019) approved list of achievement tests for one-step and two-step identification includes the Northwest Evaluation Association Tests (NWEA) and the Indiana Learning Evaluation Assessment Readiness Network (ILEARN), respectively. In

order to measure achievement for their identification process, MCS uses NWEA and ISTEP+ [2]. NWEA (2020) is a research-based organization that aims to precisely measure student growth and proficiency through the use of their Measures of Academic Performance (MAP) tests. The main NWEA assessment used by schools is the MAP Growth, which can be used from grades K-12 to measure proficiency in math, reading, language usage, and science. The math and reading tests are offered in both Spanish and English, and all of the tests are aligned to state standards, Common Core, and the Next Generation Science Standards (NGSS). Each test is administered on the computer and typically takes 45 minutes to complete. Unlike most assessments, the MAP Growth adjusts to students' responses to create, "a personalized assessment experience that accurately measures performance" (NWEA, 2020, para. 1). Students can take the test up to four times a year in the fall, winter, spring, and summer. NWEA's MAP tests also provide you with a rash unit (RIT) score. These scores are recorded every time you take the test, and in theory should improve over time. NWEA also provides a projected RIT score, which is an estimate of how the student should score on the next test. These scores allow educators to measure each students' growth index and see how their students are progressing.

The ISTEP+ previously served as the state test required for grades 3-8 in Indiana. However, in Spring of 2018, Indiana switched their summative accountability assessment to ILEARN. ILEARN measures students' achievement in English, language arts, and math between grades 3-8. In grades 4 and 6, students are tested in science, as well, and in grade 5, students are tested in social studies. ILEARN also has assessments in biology and U.S government in high school. ILEARN is a standards-based test, and both the English/language arts test and the

[2] Note that the MCS Multifaceted plan has not been updated since 2017, and in spring of 2018 Indiana's state testing changed from ISTEP+ to ILEARN.

mathematics test are computer-adaptive tests (CAT), similar to the NWEA MAP Growth. The science, social studies, biology, and U.S. government tests are all fixed-form tests, meaning they do not adjust to the students' responses and adapt accordingly[5].

While the High Ability Coordinator Handbook (Schuler et al., 2019) mentions the Torrance Tests of Creative Thinking (TTCT) as a measure of aptitude for creativity, as well as the Scales for Identifying Gifted Students (SIGS) and Gifted Evaluation Scales (GES) rating scales for leadership, creativity, and motivation, these assessments are not included in the MCS Multifaceted Plan. The TTCT was created by Ellis Paul Torrance (1962) and is widely used by schools to measure creativity because it only requires the examinee to reflect on their life experiences. As Gifted Child Quarterly (2005) explains in a report on the 40-year-follow up of the assessment, the TTCT battery consists of a verbal test that includes five activities and a figural test that has three activities. Responses to the verbal test are either written or oral, while responses to the figural test are drawn. The two tests measure different aspects of creativity, which is demonstrated by the little correlation (r= .06) between performance on the visual and figural tests (Kim, 2006). The tests were based off of Guilford's (1950) four factors of divergent thinking, which included fluency, flexibility, originality, and elaboration. Torrance adapted the tests in 1984, eliminating the flexibility scale because he was concerned about the high correlation between fluency and flexibility scores (Kim, 2006). He also believed there were other creative attributes being demonstrated on the tests that were not being measured. Today, the tests identify five norm-referenced scores, which include: fluency, originality, elaboration,

[5] Note that the ILEARN science test for grades 4 and 6 and the biology test will eventually transition to being computer-adaptive once the item bank has growth large enough to accommodate that transition (IDOE, 2019).

abstractness of titles, and resistance to premature closure. The tests also identify 13 criterion-referenced measures of creative strength which consist of: emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines or circles, unusual visualization, internal visualization, extending or breaking boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy (2006).

Identifying Creative Abilities in Students

Although the TTCT is commonly used to identify students' creative abilities, it is important to note that this was not what Torrance (1966) intended for the tests. The original intent was to understand the qualities that help people express their creativity. In a review of TTCT, Kim (2006) explained that, "the tests were not designed to simply measure creativity, but instead to serve as tools for its enhancement" (p. 4). Still, the most common use of the TTCT is for identification of children for gifted programs. This is most likely due to the fact that the TTCT allows for another perspective on student ability that is not specifically focused on achievement and aptitude in traditional content areas. Because the TTCT divided "creativity" into clear components, it allows schools to definitively measure and rate a student's creativity. Other than the TTCT, very few standardized assessments exist to measure creativity. Schools who choose not to use the TTCT to identify creativity often resort to using qualitative measures such as portfolios or teacher recommendations in their identification process, which are ultimately more subjective and difficult to measure. Thus, the issue comes down to how much of a trade-off schools are willing to make. As Renzulli (2012) suggests, while few people would argue against the importance of creativity or relevance it has to gifted education, including creativity will most likely result in some degree of subjectivity in measurement. If subjectivity

cannot be tolerated, programs will be limited to abilities that can be measured with objective tests.

Still, because this was not its intended purpose, schools should be hesitant to consider the TTCT the "be all end all". While the TTCT may be a helpful tool to recognize a student's creative abilities, schools should not use TTCT scores as a "cutoff" for programming and they should consider multiple measures of creativity when identifying students such as SIGS, recommendations, observations, and portfolios. Teacher recommendations should also be used with caution when identifying students, as studies have shown that teachers do not like creative children (Dawson, 1999). Despite acknowledging the importance of creativity, Dawson found that teachers not only dislike children with the creative personality, but their definition of "creative" differs significantly from traditional definitions. In his 1995 study of two elementary classrooms from New York, Dawson found that when comparing traditional concepts of the creative personality to teacher concepts, the concepts were opposite in almost every regard. Some significant differences to note were that traditional concepts rate creative students as impulsive, nonconformist, and emotional, while teacher concepts rated students as good-natured, appreciative, and sincere (Dawson, 1999). Portfolios and performance-assessments may be extremely valuable in an identification process because schools would get even more insight into students' creative abilities. In regard to assessing creativity, Ambrose (2014) notes that, "performance- based assessment requires students to produce an original product or to act in a prescribed way, such as writing a story, designing an experiment, acting, or problem-solving" (p. 124).

Programming Options for Creativity

Because school inherently relies on academic content to drive instruction, it makes the most sense to design a program not on creativity itself, but rather to develop curriculum that is open-ended enough to allow for creativity. Although the concept of academic standards is limiting, it would be foolish to believe that the educational system could survive without any guidelines on what to teach. However, in order to encourage creativity there certainly needs to be flexibility in some regard. Ambrose (2014) suggests that, "best practice approach would first involve the school professional being familiar with theories of creativity, which would ideally highlight the need to assess and support creativity in its multitude of manifestations" (p. 123). When it comes to models to develop creativity, several exist. The Thinking Actively in a Social Context (TASC) Model (2008) is a model for the development of thinking and problem-solving. The model is shown as a wheel so that students may return to prior steps as needed, but the steps are in order as such:

> At step one, students gather and organize the information they have about the task or the problem situation. At the second step, they define the problem or clarify the task. Next, they generate many different ways to solve the problem or do the task. After they have developed different ideas, the students develop criteria for evaluating the ideas to decide which ones to use. Then, after deciding which idea or ideas, they implement their solution or conduct their task. Next, they evaluate the idea again and share the results with others. Finally, they use their metacognitive skills to review what they have done well, what they need to improve, and what they learned; they take time to think about how to solve a similar problem better in the future. (Alhusaini, 2018)

Several studies have been conducted to assess whether the TASC model would improve gifted students' creative abilities. In one study by Davies (2008), the model was used to assess whether

the model would improve gifted students' thinking skills, problem-solving strategies, self-concepts, motivation, self-monitoring, and self- evaluation skills in science (as cited in Alhusaini, 2018). Through this study, it was found that, "the TASC model was easy to incorporate into the lessons once the children were familiar with all eight steps," and, "the model was found to be effective in involving children in their own learning and creating their own problems" (2018, p. 20).

Another method that may be applicable in a gifted program for creativity is the incubation model to teaching. "Creativity requires an open mind; individuals must resist the temptation to become attached to their first ideas and remain flexible to engage in new learning opportunities" (Hines et al., 2018, p. 36). Keeping this in mind, it makes sense that it is important to teach students methods of generating multiple ideas. Creativity is often characterized by an "aha" moment, but in order to reach this, Hines and her colleagues suggest that incubation is necessary, stating "the incubation period allows for thinking to deepen, enhancing neural connections and priming the thinker for moments of creative inspiration," and, "in order for creative thought to occur, individuals must resist the temptation to close in on their first ideas, remaining open to consider the problem from multiple viewpoints" (p. 37). Thus, the Incubation Model was created in order to provide students with guidance through this important facet of creative thinking. As Hines and her fellow researchers explain,

> Phase 1, Heightening Anticipation, is meant to arouse curiosity and instill a desire to learn. In Phase 2, Deepening Expectations, students immerse themselves into a practice with the new information encountered, digging deeper and engaging in learning through various creative thinking strategies. (p. 38)

Through phase 2, students begin to build connections with content and unearth new questions, but instead of coming to a conclusion, they desire to search for more. As a result of this new desire, students enter into phase 3, which is known as "keeping it going". In this phase, "new ideas 'sink in' as students bring learning outside of the classroom, seeking connections between content and ideas, or events from past experiences, present problems, and future images" (p. 39). In addition to these methods, schools may also consider the Design Thinking Method, Project-Based Learning, SCAMPER, and Paul's Reasoning Wheel as resources and strategies for facilitating creativity.

Conclusion

Considering that Indiana's stated definition of a gifted student does not align with its programming guidelines in regard to students who are creatively gifted, the need for change is evident. While research shows that creativity is both a necessary component of gifted education and a necessary skill in the 21st century, identification processes and programming options are difficult to agree on. When considering identification methods, the TTCT shows promise as a standardized assessment, but using multiple methods in conjunction with the TTCT, such as SIGS, portfolios, and performance assessments is the best option for now. As future research in the field continues, it would be nice to research other testing methods to measure creativity, as this will make it easier for schools to identify students. Although there are many approaches to fostering creativity in gifted students, the TASC Model and the Incubation Model show great potential for implementation in a gifted program specifically due to the fact that they could be applied to existing curricula. As Hines and her colleagues (2019) explain,

> although the assertion to teach for creativity can seem quite intimidating, educators must resist the temptation to view creativity as something extra. Creativity is not another

> column to add to already overloaded lesson plans, but rather the vehicle for meaningful learning. (p. 39)

By incorporating creative processes into school curricula and teaching students a variety of strategies for creative thinking, students will learn to develop their creative thinking. Furthermore, by investing in things like a makers' space and materials to do STEM, teachers will be able to engage students in the creative process with ease.

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